

IoT

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- Three generations of IT
- The Internet
- IoT
- What's the difference?
- A cautionary tale

Three Generations

- Many computers, many datasets
- One computer, many datasets (“the network is the computer”)
- One computer, one dataset (FAIR Data)

The Internet

- * The Internet (TCP/IP) interconnected many *computers with people attached*. (Limited to billions of people.)
- * The three original goals were to connect people to computers, to connect people to information, and to connect people to other people.
- * These goals have evolved but are still here. Rlogin has evolved to apps, ftp has evolved to the Web, and smtp has evolved (devolved?) to social media.

IoT

- * The IoT is in process of adding many *computers without people attached*, but often with sensors and/or actuators, including self-driving cars and other robots. (Virtually an unlimited number of computers)
- * Are the additional goals of IoT to connect *computers* to other computers, to connect computers to information, and to connect computers to people?
- * Examples of these goals: connecting computers to computers—my frig orders more milk; connecting computers to information—remote computers send ecological data to a collection computer; connecting computers to people—my front door camera tells me who is there.

What's the difference?

- “Computers with humans attached” get to rely on human semantics to understand the data, and Internet messages send data to specific applications, which know what to expect
- “Computers without humans” have to rely on self-described data that must be able to *interoperate* with other data and to work with any application. Currently making data interoperable is very labor intensive.
- FAIR Digital Objects (FDOs) is a technology that seeks to make data objects globally accessible and sufficiently self-described to support interoperability with minimal labor and to enable computer *actionability*. *Seems equally important for IoT and the new Open Science!*

A cautionary tale: The Data Religion *Homo*

Deus by Yuval Harari, Chapter 11

* *Dataism* declares that the universe consists of data flows, and the value of any phenomenon or entity is determined by its contribution to data processing.

* What will be the future of the global data processing system? *The Internet of All Things*

* In the eighteenth century, humanism sidelined God by shifting from a deo-centric to a homo-centric world view. In the twenty-first century, dataism may sideline humanity by shifting from a homo-centric to a data-centric view.

- I have a seat in the IoT church
- But I also believe the Hamlet dictum:
There are more things in heaven and earth
than are dreamed of in data science